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October 30, 2006

Paul Krueger
Environmental Manager,
SR 520 Project Office
414 Olive Way, Suite 400
Seattle, WA 98101

Re: *DEIS for SR 520 Bridge Replacement*
Pedestrian/Bicycle Connection at Madison Park

Dear Mr. Krueger:

C-031-001

We write to supplement earlier comments submitted on behalf of SWAMP – Save the Wetlands of the Arboretum from Multitudes of People. Those earlier comments dated September 22, 2006 demonstrated why an additional pedestrian/bicycle connection at 37th Ave. East would violate NEPA, SEPA, the Clean Water Act, the federal Department of Transportation Act and Seattle's Critical Areas Ordinance, and would unnecessarily exacerbate environmental impacts of the bridge.

We write now to provide the results of a year long wildlife study comparing the relative impacts of proposed pedestrian/bicycle connections at 43rd Ave. East and 37th Ave. East. The enclosed study, *Plant and Animal Studies Along Two Proposed Bike Trail Routes: SR 520 Bridge to Madison Park* (September 2006) was prepared by wildlife biologists at Raedeke Associates, Inc. and concludes that the 37th Ave. East street end and near shore environment provide substantially greater abundance and diversity of plants and animals than the 43rd Ave East street end. This report supplements the earlier *Wetland and Wildlife Assessment* prepared by Raedeke Associates in August 9, 2005. To be sure that it is part of the EIS comment record, I have also included a copy of Raedeke's 2005 report.

As you can see at Tables 1 - 3, the 2006 Raedeke study is based upon the collection of data at the two sites between October 2005 and September 2006 and concludes that for all seasons the 37th Ave. East street end provides far greater numbers and diversity of bird species than the 43rd Ave. East site. Accordingly, the impacts of pedestrian/bicycle connection at 37th Ave. East would be substantially greater than at 43rd Ave. East.

We request that this study be included with the *Draft EIS on the SR 520 Bridge*

C-031-001

Comment Summary:

Madison Park Bicycle/Pedestrian Connection

Response:

See Section 24.1 of the 2006 Draft EIS Comment Response Report.

C-031-001

Replacement and in particular with the *Madison Park Bicycle/Pedestrian Path Options Technical Memorandum*. The enclosed study fills two obvious gaps in the *Technical Memorandum*: 1) it provides objective data supporting the relative abundance and diversity of plant and bird species at the two sites; and 2) it offers an objective basis for comparing the relative impacts of pedestrian/bicycle bridges at those sites.

Under NEPA, SEPA, the Clean Water Act, the federal Department of Transportation Act and Seattle's Critical Areas Ordinance the state is obliged to select alternatives of lesser impact. The enclosed wildlife study, together with Raedeke's earlier *Wetland and Wildlife Assessment* (August 9, 2005) clearly demonstrate 43rd Ave East to be the connection of lesser impact. Nonetheless, SWAMP continues to question the justification for either pedestrian/bicycle connection, given their projected costs and the existence of other connections with far fewer environmental impacts.

SWAMP appreciates your consideration of these additional comments.

Sincerely yours,

Jeffrey M. Eustis

JME/km
cc: SWAMP

PLANT AND ANIMAL STUDIES ALONG TWO PROPOSED BIKE TRAIL ROUTES: SR 520 BRIDGE TO MADISON PARK

Final Report to: S.W.A.M.P
King County, Washington

September 28, 2006

RAEDEKE ASSOCIATES, INC.

Project Manager:	Dale R. Herter, M.S. Associate/Wildlife Biologist
Project Personnel:	Joel W. Merriman, M.S. Wildlife Biologist
	Lisa J. Danielski, B.S. Wetland Ecologist and Botanist

INTRODUCTION

This report documents our observations on numbers and diversity of birds and vegetation studied at the two proposed bike trail routes from the new SR 520 Bridge and the Madison Park neighborhood. We comment on differences in numbers and diversity of birds at each location and contrast this diversity to other sites on Lake Washington. Avian studies were completed from October 2005 through September 2006. Vegetation transect data were gathered in October 2005.

METHODS

Bird Observations

We conducted twice-monthly observations of all water birds and land birds seen within the proposed bike trail routes at both the 37th Avenue East (hereafter 37th Avenue) street end and the 43rd Avenue East (hereafter 43rd Avenue) street end. We observed birds for 1 hour consecutively at each location beginning in mid-October and continuing through late December. Observations were taken from docks and/or in a canoe or row-boat to observe all areas that could be affected by the bike routes. The starting time for observations varied from early morning to late afternoon to span the time of day that birds could be using the affected areas. We also alternated starting locations between the 37th Avenue end and the 43rd Avenue end between visits.

Birds were first observed from land prior to moving into each area with a canoe or row-boat because some birds flushed from the observation areas once the watercraft was launched. We included all birds seen, even though some birds flying over the sites may not have been directly associated with the sites, however some flying birds were foraging from the air over the sites. Both areas are approximately equal in size and include all habitats (on land or water) that could be impacted by the routes and a 100-meter disturbance envelope on each side of the proposed trails.

Vegetation Transects

We documented the vegetation present along both bike trail routes using 200-meter long transects with twenty 1-meter^2 plots taken at 10-meter intervals along each transect line. We used a canoe to access shallow lakebed and wetland areas. We estimated plant cover using a 1-meter^2 plot frame made of detachable PVC tubing that floated on the water. We took visual estimates of percent area of plant cover on each plot and included all layers, from below the water surface to tree branches hanging over the plot grid. Measurements were taken on 19 October 2005, prior to major senescence of forbs and aquatic plants. We did not sample street-side areas along each street because most of the plants in these areas were ornamentals planted on private lots.

RESULTS

Birds

The diversity of bird species was generally greater at the 37th Avenue E observation site than at the 43rd Avenue E site during most of the 24 survey visits (Table 1). On only one visit (9 February 2006) did we count the same number of bird species on each route. On a few visits we counted fully twice the number of bird species at the 37th Avenue site than at the 43rd Avenue site. We observed several nesting birds at the 37th Avenue site, including successful nesting by mallards, gadwalls, wood ducks, song sparrows, cedar waxwings, and bushtits which all produced broods of young in the vicinity. There is a greater diversity of habitats for birds present in the 37th Avenue area, including a small area of native forest, emergent shrubby and herbaceous wetlands, and floating and submerged aquatic vegetation over a shallow lake bed. These areas provide safe feeding and nesting sites that are removed from regular human disturbance.

Habitat in the vicinity of the 43rd Avenue street end is mostly non-native suburban yards bordering a gravelly lakeshore that slopes rather steeply to deep water. Water birds that dive for food (such as grebes and diving ducks) were the only group that appeared to be more common at the 43rd Avenue site, while shallow water dabbling ducks, raptors, shorebirds, and native wetland and woodland birds were more common and diverse (more species present) at the 37th Avenue site. The only nest we observed at the 43rd Avenue site was that of a green heron initiating a nest in shore side trees which eventually failed due to crow predation. Broods of starlings, house sparrows, and white-crowned sparrows were also observed at the 43rd Avenue site. The site receives greater boat traffic and regular human disturbance from the nearby apartments and condominiums.

Overall, we counted 2693 birds of 77 species at the 37th Avenue site over the entire year, while counting 1634 birds of 52 species at the 43rd Avenue site during the same time period. Tables showing our survey results are presented in Table 2.

Vegetation

Vegetation was more diverse on transects from the 37th Avenue street end than from the 43rd Avenue street end. Again, the wetland edge, and shallow lake bed at the 37th Avenue site provides better growing conditions for a variety of plants than does the rather deep lake bed and wind-washed shore at the 43rd Avenue site. Native terrestrial vegetation was also generally more abundant in the 37th Avenue area than in the 43rd Avenue area. The introduced white water-lily dominates aquatic habitats in this area, but it appears to provide similar habitat for water birds as does the species it replaced, the native yellow water lily. We found that the submergent plant community was not dominated by the introduced Eurasian water milfoil, but was dominated by native plants, which provide food for the large flocks of common coots and other waterfowl which used the site in abundance during the non-breeding season.

Tables 3 provides a summary of the results of our vegetation transects. This table shows an average percent cover over the entire transect at each location for all species we encountered.

Other Species

In addition to birds, we observed individual beaver, muskrat, and river otter using the 37th Avenue site on at least 3 days. We observed one muskrat on 1 day at the 43rd Avenue site.

DISCUSSION

Our studies at the two proposed bike trail routes indicate that the 37th Avenue route, in general, provides more important habitat for birds than does the 43rd Avenue route. The preponderance of native terrestrial vegetation, the extensive shallow emergent and floating plant communities, the overall variety of habitat types, and the isolation from human disturbance all combine to make this portion of the Lake Washington shore at the 37th Avenue street end an unusually diverse habitat area for birds.

The street end, although public, is used by only a few people during each day, generally hikers and picnickers from local neighborhoods. This provides a little-disturbed corner of the Foster Island wetlands where water birds and raptors, in particular, can find loafing sites free of frequent human intrusion. The site appears to be an important feeding area for flocks of waterfowl that winter on Lake Washington. Fish-eating birds such as grebes and cormorants also commonly use the site, feeding on both native and introduced fish species that often compete or predate on native salmon fingerlings. Human disturbance, particularly if irregular and unpredictable, and by humans outside of vehicles (which is more threatening to the animals) such as a trail, tends to be more disturbing to wildlife than regular, non-threatening structures such as an elevated roadway or other structure with regular vehicle traffic.

Terrestrial and wetland thickets such as those at the 37th Avenue street end are now rare on Lake Washington and provide safe nesting sites for several bird species during the spring and summer, and appear to be only infrequently used by American crows, a common nest predator in the Seattle area. Migrant songbirds also use the site both in spring and fall, where the dense waterside vegetation provided good foraging for migrating insectivorous birds.

Lake Washington in general is characterized by urbanized shorelines, docks and marinas, and non-native urban plantings. The 37th Avenue street end provides habitat for birds that is rare today along the lake shore. The 43rd Avenue site, in contrast, provides habitats that are common along Lake Washington. The lawns and ornamental plantings at this street end, and the generally steep lake bed are both common habitats found on the shorelines of the lake. The lower numbers and diversity of birds at this site is typical of that found along the remainder of lake, except for those few areas where natural wetland fringes predominate, such as the Foster Island wetland complex and the Mercer Slough area on the east side of the lake.

SUMMARY

Although the 43rd Avenue street end does provide habitat for some bird species, both numbers and diversity appear to be much lower than in the vicinity of the 37th Avenue street end. This pattern of abundance and diversity of birds between the two sites persists throughout the year and encompassed all 4 seasons studied. Impacts from a proposed bike trail are anticipated to be greater on native vegetation, wildlife habitat, and bird populations at the 37th Avenue site than at the 43rd Avenue site.

Limitations

The determination of ecological system classifications, functions, values, and risk assessments is an inexact science, and different individuals and agencies may reach different conclusions. We cannot guarantee the outcome of such determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies.

We warrant that the work performed conforms to standards generally accepted in our field, and prepared substantially in accordance with current technical guidelines and criteria. The conclusions of this report represent the results of our analysis of the information provided by project proponent and their consultants, together with information gathered in the course of the study. No other warranty, expressed or implied, is made.

Table 1.

Bird Observations at Alternative Routes for the Proposed SR 520 Bike Trail to Madison Park

37th Avenue E. Route

Oct. 2005 - Sep. 2006	19-Oct	26-Oct	9-Nov	22-Nov	12-Dec	29-Dec	10-Jan	26-Jan	9-Feb	23-Feb	9-Mar	23-Mar	11-Apr	26-Apr	12-May	26-May	9-Jun	29-Jun	7-Jul	27-Jul	7-Aug	23-Aug	8-Sep	23-Sep	**Total**	*Average*
Total Number of Birds	**86**	**60**	**114**	**240**	**97**	**202**	**276**	**161**	**125**	**85**	**104**	**98**	**108**	**58**	**75**	**61**	**77**	**73**	**85**	**84**	**60**	**113**	**138**	**113**	**2693**	*112*
Total No. Water Birds	75	51	99	233	89	183	175	123	73	74	63	61	62	31	11	14	22	20	28	17	17	30	41	76	1668	*70*
Total No. Land Birds	11	9	15	7	8	19	101	38	52	11	41	37	46	27	64	47	55	53	57	67	43	83	97	37	1025	*43*
Number of Species	**20**	**17**	**23**	**18**	**16**	**19**	**26**	**27**	**15**	**19**	**28**	**27**	**26**	**20**	**30**	**24**	**24**	**23**	**23**	**22**	**14**	**20**	**21**	**25**	**77**	*24*
No. Water Bird Species	12	13	12	13	12	11	14	10	10	11	13	11	10	9	5	5	5	6	5	5	5	7	8	12	30	*10*
No. Land Bird Species	8	4	11	5	4	8	12	17	5	8	15	16	16	11	25	19	19	17	18	17	9	13	13	13	47	*14*

43rd Avenue E. Route

	19-Oct	26-Oct	9-Nov	22-Nov	12-Dec	29-Dec	10-Jan	26-Jan	9-Feb	23-Feb	9-Mar	23-Mar	11-Apr	26-Apr	12-May	26-May	9-Jun	29-Jun	7-Jul	27-Jul	7-Aug	23-Aug	8-Sep	23-Sep	**Total**	*Average*
Total Number of Birds	**67**	**78**	**24**	**58**	**302**	**38**	**58**	**75**	**52**	**86**	**55**	**95**	**59**	**28**	**23**	**51**	**45**	**57**	**52**	**44**	**38**	**106**	**108**	**35**	**1634**	**68**
Total No. Water Birds	48	72	18	46	297	26	51	61	45	84	48	74	46	9	4	22	23	21	29	16	6	17	10	23	1096	*46*
Total No. Land Birds	19	6	6	12	5	12	7	14	7	2	7	21	13	19	19	29	22	36	23	28	32	89	98	12	538	*22*
Number of Species	**15**	**16**	**8**	**13**	**14**	**4**	**13**	**13**	**15**	**15**	**16**	**18**	**16**	**11**	**12**	**14**	**14**	**17**	**12**	**11**	**12**	**17**	**12**	**13**	**52**	*15*
No. Water Bird Species	12	12	6	8	12	3	10	10	12	14	12	13	11	6	3	4	7	5	3	3	4	4	2	7	27	*8*
No. Land Bird Species	3	4	2	5	2	1	3	3	3	1	4	5	5	5	9	10	7	12	9	8	8	13	10	6	25	*7*

Table 2.

Abundance and Frequency of Birds Encountered at the Two Proposed Bike Paths

Species	37th Ave.	43rd Ave.	37th Ave.	43rd Ave.
WATER BIRDS	Number Encountered		Frequency of Occurance	
Pacific Loon		1		4%
Western Grebe		10		17%
Red-necked Grebe		4		13%
Pied-billed Grebe	40	22	67%	58%
Horned Grebe	2	2	4%	8%
Double-crested Cormorant	25	43	50%	50%
Great Blue Heron	21	2	63%	8%
Green Heron		3		8%
Canada Goose	79	121	50%	67%
Mallard	117	49	88%	50%
Northern Pintail	2		4%	
Northern Shoveler	3		8%	
American Wigeon	21	4	25%	8%
Gadwall	110	14	67%	29%
Green-winged Teal	17		29%	
Wood Duck	61	3	63%	8%
Ring-necked Duck	181	148	46%	42%
Bufflehead	178	133	54%	58%
Canvasback		8		8%
Greater Scaup	1	5	4%	13%
Lesser Scaup	63	87	42%	42%
Common Goldeneye		19		38%
Surf Scoter		1		4%
Common Merganser	6	14	17%	25%
Red-breast. Merganser	1		4%	
Hooded Merganser	3		4%	
American Coot	657	289	63%	42%
Virginia Rail	1		4%	
Sora	1		4%	
Killdeer	2		4%	
Spotted Sandpiper	2		4%	
Mew Gull	6	2	13%	8%
Ring-billed Gull	32	26	46%	54%
California Gull	1	14	4%	13%
Glaucous-winged Gull	25	69	67%	75%
American Herring Gull	2		8%	
Belted Kingfisher	8	3	33%	13%

Table 2 (cont.)	37th	43rd	37th	43rd
LAND BIRDS	Number Encountered		Frequency of Occurance	
Bald Eagle	6		21%	
Red-tailed Hawk	2		8%	
Cooper's Hawk	1		4%	
Sharp-shinned Hawk	1		4%	
Peregrine Falcon		1		4%
Rock Pigeon	36	53	54%	54%
Band-tailed Pigeon		1		4%
Vaux's Swift	41	45	17%	8%
Anna's Hummingbird	24		71%	
Northern Flicker	5		17%	
Downy Woodpecker	17		54%	
Western Wood Pewee	2	1	8%	4%
American Crow	63	48	96%	79%
Steller's Jay	1	2	4%	8%
American Robin	67	22	67%	29%
Brown Creeper	1		4%	
Bewick's Wren	19	4	54%	13%
House Wren	1		4%	
Marsh Wren	13	1	42%	4%
Red-breasted Nuthatch	2		4%	
Black-capped Chickadee	93	18	92%	42%
Chestnut-backed Chickadee	1		4%	
Bushtit	41	23	50%	21%
Purple Martin	1		4%	
Barn Swallow	52	40	29%	42%
Cliff Swallow	120	46	38%	33%
Violet-green Swallow	10	24	21%	29%
Ruby-crowned Kinglet	7		21%	
Golden-crowned Kinglet	2		8%	
Cedar Waxwing	18	2	29%	4%
European Starling	138	98	46%	42%
Warbling Vireo	3		13%	
Orange-crowned Warbler	1		4%	
Wilson's Warbler	3		8%	
Yellow Warbler	2	1	8%	4%
Yellow-rumped Warbler	5		8%	0%
Song Sparrow	46	4	88%	17%
White-crowned Sparrow	1	13	4%	25%
Dark-eyed Junco	6	1	13%	4%
Spotted Towhee	4		13%	
Black-headed Grosbeak	2		8%	
House Finch	55	19	63%	29%
Purple Finch	1		4%	
American Goldfinch	31	12	54%	4%
Western Tanager	1		4%	
Brewer's Blackbird	4		4%	
Red-winged Blackbird	71	6	79%	8%
Brown-headed Cowbird	3		4%	
House Sparrow	1	53	4%	63%
TOTAL	**2693**	**1634**		

Table 3.
Average Percent Plant Cover of Species Encountered on the Two Bike Path Routes

Species	37th Avenue E.	43rd Avenue E.
Trees and Shrubs		
Black Cottonwood	1.25	
Oregon Ash		0.05
Scouler's Willow	1.50	
Sweet Cherry	1.05	
European Holly	0.20	
English Laurel		0.75
Butterfly Bush		1.75
Himalayan Blackberry	8.20	1.00
English Ivy	0.40	1.25
European nightshade	1.25	
Pacific Willow	0.05	
Herbs and Grasses		
Giant Horsetail	1.50	
Field Bindweed	0.50	
Creeping Buttercup	0.50	
Small Bedstraw	0.25	
Small-flowered Forget-me-not	3.25	
Dovefoot Geranium	0.05	
Seaside Trefoil	0.05	
Primrose	0.05	
Beggarticks	0.10	
Tufted Vetch	0.05	
Common Dandelion	0.05	
Hawkweed	0.05	
Bluegrass	5.25	
Sweet Vernalgrass	0.25	
Velvetgrass	0.50	
Tall Fescue	0.25	
Ryegrass	0.35	
Aquatics		
White Water-lily	30.75	
Common Duckweed	1.25	
Purple-fringed Riccia	0.20	
Coontail	11.30	
Eurasian Water-milfoil	0.15	0.05
Grassy Pondweed	0.05	
White-stalked Pondweed		0.25
Northern Water Horehound	0.55	
Common Cattail	3.50	
Common Rush	2.50	

August 9, 2005

Mr. David Allen, Senior Planner
Seattle Department of Transportation
P.O. Box 34196
Seattle, WA 98124

RE: State Route 520 Proposed Bicycle Trail
Wetland and Wildlife Assessment
(RAI Project No. 2005-048-001)

Dear Mr. Allen:

This document provides an initial assessment of the effects on wetland and wildlife resources of the proposed bicycle trail access points in the Madison Park neighborhood. The proposed trail is associated with the future replacement and widening of the State Route (SR) 520 bridge across Lake Washington, for which all proposals include a bicycle/pedestrian trail running along the length of the new bridge (Draft EIS prepared under the direction of the Washington Department of Transportation; CH2M Hill 2005). A connection to the Madison Park neighborhood is being proposed by interest groups seeking access for pedestrians and cyclists to the new SR 520 bridge.

The author of this summary letter is a professional wildlife biologist with 17 years of experience in the Seattle area and who has lived near the Madison Park neighborhood for that same period of time. Many of the observations used in this letter are based on 17 years of observations in and near the site of the proposed bike trail access routes.

BACKGROUND

As of summer 2005, a Draft Environmental Impact Statement (DEIS) concerning replacement and widening of the SR 520 bridge was prepared by CH2M Hill (2005) and other consultants, and is now under public review. This document addresses environmental concerns surrounding the replacement and widening of the SR 520 bridge. Outside of the DEIS current scope, but potentially to be included in the EIS, is a proposal for a connection to the planned SR 520 pedestrian/bicycle trail that is anticipated to link the Madison Park neighborhood directly to the bridge via the 37th Avenue E street-end or the 43rd Avenue E street-end (see Figure 1). Both of these trail locations would transfer bicycle traffic from the SR 520 bridge onto side-streets in the northern portion of the Madison Park neighborhood.

The 37th Avenue E route would involve construction of a causeway to support the bicycle trail over shallow open water and a wetland complex located east of Foster Island and north of the Broadmoor Golf Course (Figure 1). A 43rd Avenue E route would also

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involve construction of a causeway across shallow open water but would not affect any wetlands identified in the City of Seattle Environmentally Critical Areas ordinance.

EXISTING CONDITIONS

Wetlands

The area around the 37th Avenue E street-end consists of a gravel-surfaced, one-lane street leading to a small wooden dock maintained by the City of Seattle. This dock is used by occasional canoeists and kayakers to access the canoe trail in the Foster Island area. Two private residence are immediately east of the street, and the outer fence surrounding the Broadmoor Golf Course is immediately west of the street. The street-end itself is in a small grove of cottonwood trees adjacent to aquatic bed wetlands which surrounds the dock. Immediately adjacent to the dock is a white water lily/Eurasian milfoil plant community. Approximately 75 feet off the end of the dock are emergent and scrub/shrub wetland communities.

The wetland complex near the 37th Avenue E route is designated as an Environmentally Critical Area by the City of Seattle, Department of Planning and Development (DPD). According to Seattle Municipal Code, an Environmentally Critical Area may include: (1) geologic hazard areas, (2) flood-prone areas, (3) riparian corridors, (4) wetlands, (5) fish and wildlife habitat conservation areas, and (6) abandoned land-fills. The wetland that would be affected by the 37th Avenue E route is a complex lake-fringe wetland consisting of aquatic bed submerged and floating plants, shallow water emergents, scrub-shrub, and forested wetland plant communities. All plant community types would be affected by the 37th Avenue E route. A description and abbreviated list of plants found in these plant communities follows:

Aquatic bed: This vegetation community occurs in shallow water with a mud or silt bottom dominated by the floating leaves of white water-lily (*Nymphaea odorata*) and pondweeds, (*Potamogeton* spp.) along with submerged aquatics such as Eurasian water-milfoil (*Myriophyllum spicatum*), coontail (*Ceratophyllum demerum*), and waterweeds (*Elodea* sp.).

Emergent: This community is composed of what is commonly referred to as open marsh vegetation dominated by cattails (*Typha* spp.) and bur-reeds (*Sparganium* spp.), with purple loosestrife (*Lythrum salicaria*) and yellow water flag, (*Iris pseudacorus*) also common.

Scrub/Shrub: A large part of the wetland consists of woody plants growing in saturated soils, dominated by hardhack spirea (*Spiraea douglasii*), willows (*Salix* spp.), red-osier dogwood (*Cornus sericea*), high-bush cranberry (*Viburnum edule*), and paper birch (*Betula payrifera*).

Forested wetland: Dominated by an overstory of black cottonwood (*Populus balsamifera*), red alder (*Alnus rubra*), and Oregon ash (*Fraxinus latifolia*), with an

understory of Indian plum (*Oemleria cersiformis*), common snowberry (*Symphoricarpos albus*), Himalayan blackberry (*Rubus discolor*), salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*), and giant horsetail (*Equisetum telmateia*).

Based on field review in August 2005, we rated this wetland as a Category II wetland, following the Washington State Department of Ecology wetland rating system currently adhered to by the Seattle Department of Planning and Development [(DPD) formerly the Department of Construction and Land Use (DCLU)]. This indicates that it is a wetland that is difficult to replace, and which provides high levels of water quality, hydrologic, and/or wildlife habitat functions. Seattle DPD regulations require that any wetland determined to be an Environmentally Critical Area receive a 50-foot no entry buffer if development is proposed near the wetland. This buffer may be increased to 100 foot or possibly 125 feet if the wetland is determined to have high habitat value. The City of Seattle DPD has determined that this wetland is a "*wetland of exceptional value*" (Ms. Donna Talley, DCLU from the notes of a December 1, 1994 Inter-agency meeting). This designation was likely given because of the general lack of large, lake-fringe wetlands on Lake Washington and its overall value to local wildlife populations.

Wildlife Habitat

The wetland complex in the west Union Bay/Foster Island area constitutes some of the largest lake-fringe wetlands remaining on the shores of Lake Washington. This area is of significant wildlife habitat value and the abundance of birds and mammals provide recreational opportunities to city residents at all seasons. During the spring and summer, nesting waterfowl such as Canada geese, mallards, wood ducks, and American coots, as well as green herons, Virginia rail, red-winged blackbird, common yellowthroat, yellow warbler, song sparrow, and marsh wren attract the attention of canoeists and hikers using the nearby canoe trails and recreational trails in the area. In fall and winter, large groups of wintering waterfowl use the bay and associated wetlands as a feeding and refuge area. It is common in the winter to observe groups of dabbling ducks such as wood duck, mallard, northern pintail, gadwall, American wigeon, and green-winged teal, as well as coots and pied-billed grebes feeding in the wetlands, with larger flocks of diving ducks, including common and Barrow's goldeneye, lesser scaup, canvasback, ring-necked duck, and bufflehead feeding in the protected, shallow waters surrounding the wetlands. The site is also used by a number of fish-eating species such as great blue heron, double-crested cormorant, western grebe, common and hooded merganser, and belted kingfisher.

During all seasons, a pair of bald eagle uses the site and has established at least three different nest trees in the immediate area (WDFW Broadmoor bald eagle territory #1979; see Figure 1). The easternmost nest tree is located on the Broadmoor Golf Course and is placed in a large crook of a tall Douglas fir. This nest is within 250 feet of 37th Avenue E and was active in 2005. The nest contained a nearly-fledged juvenile eagle based on field review in early August 2005. The other nest sites are major crooks in large black cottonwood trees and have both been active in recent years. The bald eagles regularly forage in the wetland complex, attracted to both fish and waterfowl prey common in the shallow waters. Red-tailed and Cooper's hawk and osprey also regularly use the nearby

wooded areas and wetlands, respectively, for hunting. A red-tailed hawk nest has been reported near the area by Broadmoor Golf Course staff.

Also present in the wetland are signs of mammal activity, including beaver-cut trees and a recently active beaver lodge approximately 75 feet from the end of 37th Avenue E. There are also frequent sightings of muskrat, river otter, and mink by trail users in association with this wetland complex.

Lake-fringe wetlands also provide breeding and rearing habitat for several species of fish that are resident in Lake Washington, such as brown bullhead and pike-minnow. These species establish nest sites in very shallow waters, often in areas of submerged aquatic plants and floating aquatic plants. These fish in turn often become food for birds and migrating and resident salmonids such as coho, Chinook, and sockeye salmon, as well as bull and cutthroat trout.

ASSESSMENT OF IMPACTS

Wetlands

In the Development Standards for Wetlands in the City of Seattle's Environmentally Critical Areas regulations, Section 25.09.160, it states that, "No grading, filling, draining, and/or development shall be permitted within or over *wetlands of exceptional value* and its buffer as delineated by a survey accepted by the Director." The wetlands north of the 37th Avenue E street-end have been termed wetlands of exceptional value by a City employee (op. cit.) and their consultant (letter dated June 1, 1998 from Dyanne Sheldon to Kevin Stoops, Seattle Department of Parks and Recreation). Their value to local wildlife has been reiterated by both the Seattle Audubon Society (letter dated January 8, 1998 by Kit Walther to Seattle Department of Parks and Recreation) and the Washington Department of Fish and Wildlife (letter dated April 2, 1990 from Ted Muller to Carroll Smith, Seattle Engineering Department, and letter dated April 16, 1993 to Cheryl Chow, Seattle City Council). The uniqueness and potential for disturbance of wildlife in the wetlands north of the Broadmoor Golf Course has probably contributed to the failure of bike and pedestrian trail proposals linking the arboretum with the Madison Park neighborhood thus far (Galloway and Barker Architects 1997, City of Seattle Department of Parks and Recreation 1999).

The wetlands near the 37th Avenue E street-end are not unusual as far as the plant communities present, however the complexity of the wetlands and their large size are unique in this part of the city. Shoreline habitat along Lake Washington has been heavily affected by residential construction, lawns, dock construction, and public facilities such as marinas, parks, and roadways. Large lake-fringe wetland complexes are only found on Lake Washington at a few locations. Only two other large wetlands currently exist on the lake, one at Sammamish Slough near Kenmore, and the other at Mercer Slough near Factoria. Lake-fringe wetlands are important because they serve to protect adjoining uplands from erosive waves or currents along the margins of large water bodies. Vegetation along the shoreline helps dissipate energy from waves that otherwise could

erode beaches and upland areas. Lake-fringe wetlands also provide important habitat for wildlife such as amphibians and waterfowl. Vegetation in lake-fringe wetlands also can protect water quality in lakes by trapping and taking up sediments and pollutants that run-off from upland areas before they can enter the lake system.

Construction of an elevated causeway for a multi-use bicycle/pedestrian trail to 37th Avenue E would involve placement of a series of pilings into the lake bed and wetland habitats, with the resulting disturbance and shading of three or four different wetland plant communities, as well as shallow open water lake habitat. Because of its rating as a "wetland of exceptional value", a 125-foot buffer may be warranted for this wetland (Figure 1). An alternative location, construction of an elevated causeway to the 43rd Avenue E area, would involve construction over shallow open water lake habitat and suburban yards and would not affect wetlands or Environmentally Critical Areas.

In addition, other recreational opportunities other than hiking or biking at the site would likely be affected. In order to maintain a 5% grade on the bike trail from the proposed elevated western high-rise on the new SR 520 bridge, most of the 2500 block of 37th Avenue E may need to become a ramp, potentially eliminating public access to the dock and canoe routes in this area.

Wildlife

The wetland complex north of the 37th Avenue E street-end provides a relatively undisturbed resting and feeding area for a number of wildlife species that are relatively rare in the Seattle urban environment. Wintering and breeding waterfowl, and aquatic mammals concentrate in this area because of the high habitat quality and lack of human disturbance. Wildlife in this wetland have become accustomed to steady artificial noise such as the traffic on the SR 520 bridge, and a low level of nearby human activity at adjacent lawns and docks, including infrequent boaters and canoeists. This particular arm of the lake, with a heavy cover of floating plants, very shallow water, and restricted access to the remainder of the lake because of the bridge deck, has created a refuge for wildlife due to the generally low levels of human use. Wildlife will often become accustomed to steady highway traffic, however, an elevated bicycle/pedestrian ramp as proposed, would incrementally increase local human disturbance levels because of the uneven and unpredictable nature of human presence on such a structure. Such disturbance and the presence of the structure itself may reduce or even preclude use of nearby habitats by some species of wildlife. Particularly affected would be flocks of wintering and breeding waterfowl which are easily flushed by close human approach and tend to abandon habitat that is frequently and unpredictably disturbed by human activity (Josselyn et al. 1988).

Because this area provides a refuge for waterfowl, it is undoubtedly used as a hunting area by the Broadmoor bald eagle pair. At the end of 37th Avenue E is a large cottonwood tree that is of sufficient size to provide a hunting perch for the eagles. This tree may have to be removed if the access ramp for the bike trail were to be built. Large

cottonwood trees are uncommon adjacent to the lake shore and wetlands of Union Bay and Foster Island, so this tree may be of particular value to this pair of eagles. The beaver lodge just off the end of 37th Avenue E would probably also have to be removed during construction of the ramp. An even larger lodge will probably be removed during construction of the SR 520 bridge, multiplying impacts to this species (CH2MHill 2005). If approval is given to build the access ramp (possibly up to 14 ft. wide), some aquatic bed habitat, emergent habitat, and scrub/shrub habitat would also be removed to install the ramp. Shading of these habitats and the ramp itself may preclude use of the habitats by most wildlife post-construction.

Construction of a new ramp for a bike trail from the end of 37th Avenue E would involve disturbance of wetland habitats and their buffers as described above. Extensive wetlands are rare on the Lake Washington shoreline and the remaining wetlands provide important habitat for many species of wildlife, including the threatened bald eagle. Avoidance of impacts by not constructing the causeway across wetlands would be the primary technique in minimizing or eliminating impacts to these critical habitats. Elevating a causeway for the bike trail would result in lesser shading affect, however disturbance of wildlife dependent on this wetland would remain a serious consideration.

CONCLUSIONS

A route via the 37th Avenue E street-end would result in filling, shading, and disturbance to an important urban wetland and the relatively undisturbed wildlife habitat that it provides. The site is designated as a City of Seattle Environmentally Critical Area, and has been termed a "wetland of exceptional value", which may receive as much as a 125-foot buffer, indicating that avoidance and/or mitigation for loss of habitat would be difficult. An alternative route to the 43rd Avenue E street-end, while not the focus of this study, would likely result in lesser impacts to wetlands and wildlife habitat.

Sincerely,

RAEDEKE ASSOCIATES, INC.

Dale R. Herter, Wildlife Biologist

cc: S.W.A.M.P.(Save the Wetlands of the Arboretum and Madison Park)

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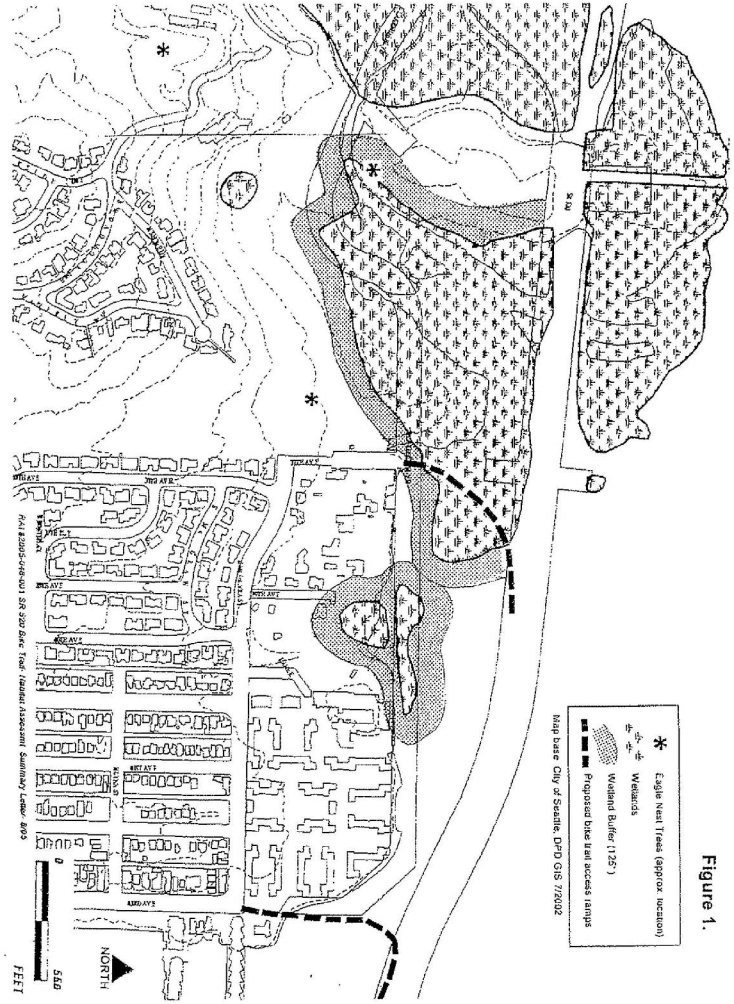
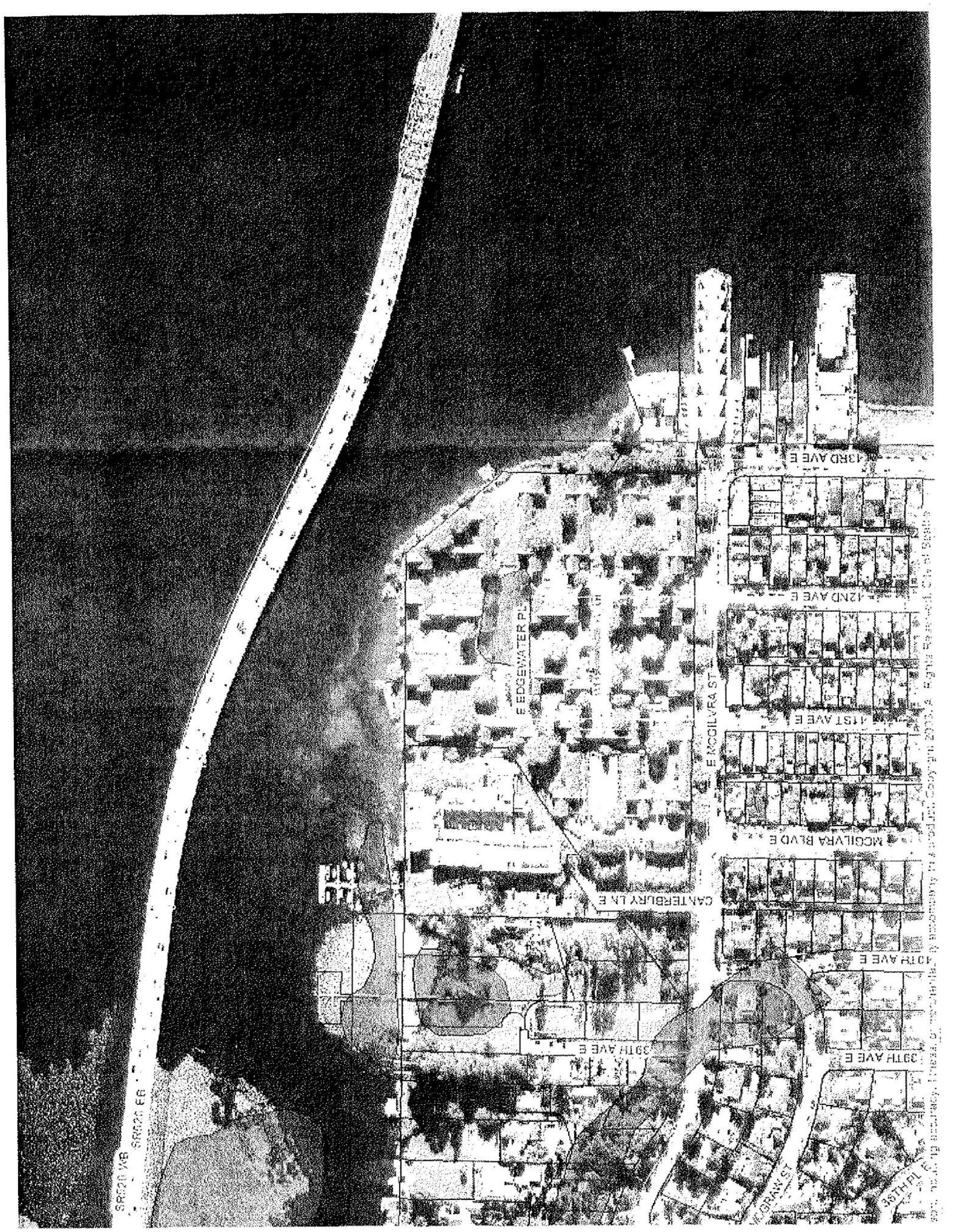

Eagle Nest Trees (approx. location)
Wetlands
Wetland Buffer (125')
Proposed bike trail access ramps
Map base: City of Seattle, DPD GIS 7/2002
NORTH
FEET
0
550

Figure 1.



43RD AVE E
42ND AVE E
41ST AVE E
MCGILVRA BLVD E
CANTERBURY LN E
40TH AVE E
39TH AVE E
E EDGEWATER PL
E MCGILVRA ST
SR520 WB
SR520 EB